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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,782	10/27/2003	Martin John Guy	PAT2594A-2US	1025

42534 7590 11/29/2006

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EXAMINER	
SEDIGHIAN, REZA	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,782	GUY, MARTIN JOHN	
	Examiner	Art Unit	
	M. R. Sedighian	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/27/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This communication is responsive to the application filed by Martin John Guy for "Suppression of Four-Wave Mixing in ultra dense WDM optical communication systems through optical fiber dispersion map design" filed on 10/27/2003. Claims 1-14 are now pending.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dennis et al. (US Patent No: 6,411,408).

Regarding claim 1, Dennis discloses a multichannel optical wavelength division multiplexed transmission system (12, 14, fig. 2) for connecting between a multiplexer (14, fig. 2) and a demultiplexer (32, fig. 1), the system comprising a plurality of serial spans (16_1, 16_2, 20, 28, fig. 2) extending between multiplexer and the demultiplexer, wherein a first span (16_1, 16_2, 18, fig. 2) is arranged to be connected to the multiplexer (14, fig. 2) and each span comprises a length of optical transmission fiber (18, 20′, fig. 2), a dispersion compensation module DCM (20′, section III, fig. 2) and an optical amplifier (26, fig. 2), and wherein located immediately following a last span (28, fig. 2) and connected thereto is a further DCM (30, fig. 2) having properties selected to substantially complete the chromatic dispersion compensation over the total length of the spans (col. 4, lines 35-40, col. 5, lines 9-13). Dennis differs from the claimed invention in that Dennis does not specifically disclose the properties of the DCM are being selected to suppress four-wave mixing rather than to provide complete chromatic dispersion

compensation of the respective span. Dennis discloses compensation fibers 20′ and 20″ to compensate the dispersion and to prevent inter-symbol interference from one pulse spreading to a nearest neighbor and to compensate any timing jitter (col. 4, lines 41-50, 67, col. 5, lines 1-17). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention that the dispersion compensation fiber spans such as the ones of Dennis can reduce non-linear interaction between channels, such as four-wave mixing, to provide an increase in the transmission data rate and to increase the transmission distance.

Regarding claim 2, Dennis discloses the optical amplifier (26, 28, fig. 2) in each serial span is of a two-stage design with the DCM (20, 20′, 20″, fig. 2) placed between them.

Regarding claim 3, Dennis discloses each DCM comprises a length of dispersion compensating fiber (18, 20′, 20″, fig. 3).

Regarding claims 4-5 and 7, Dennis discloses the dispersion values of the DCFs are fixed (col. 3, lines 62-64) and further discloses the length of each DCF is selected to suppress the non-linearities (col. 5, lines 2-17, 51-56).

Regarding claim 6, Dennis discloses an optical amplifier (28, fig. 2) is interposed along the length of dispersion compensating fiber which serves as the further DCM (30, fig. 2).

Regarding claim 12, Dennis discloses an optical post-amplifier (26, fig. 2) and an optical pre-amplifier (the pre-amplifier in the receiver of fig. 3).

4. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dennis et al. (US Patent No: 6,411,408) in view of Auracher (US patent No: 5,392,377).

Regarding claims 8-9, Dennis differs from the claimed invention in that Dennis does not disclose there are 400-2000 channels at a spacing of 5-10 GHz. Auracher discloses an optical transmission system (fig. 1) having a plurality of optical signals of closely adjacent channels (col. 6, lines 36-45) with a channel spacing of 10 GHz (col. 6, lines 50-55). Therefore, it would have been obvious to an artisan at the time of invention to incorporate a signal transmission system and method such as the one of Auracher for the optical signal transmission in the communication system of Dennis to provide a plurality of channels that are closely spaced to further provide an increase in the transmission capacity of the system.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dennis et al. (US Patent No: 6,411,408) in view of Kai (US Patent No: 6,154,588).

Regarding claim 10, Dennis differs from the claimed invention in that Dennis does not specifically disclose the DCM is a fiber Bragg grating. However, incorporating fiber Bragg grating for dispersion compensation is well known in the art. For example, Kai discloses dispersion compensation fiber Bragg grating (col. 5, lines 45-64). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate dispersion compensation fiber Bragg grating, as it is taught by Kai for the dispersion fibers in the spans of Dennis to provide a dispersion compensating fiber that has a flat loss characteristic over the operating wavelength range and to provide compensation for a longer distance.

6. Claim 11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dennis et al. (US Patent No: 6,411,408) in view of Ford et al. (US Patent No: 6,392,769 B1).

Regarding claims 11 and 13-14, Dennis differs from the claimed invention in that Dennis does not disclose at least one span contains a channel add-drop node. Ford discloses an optical span (104a, fig. 1) with an add/drop node (104, fig. 1). As it is taught by Ford, it would have been obvious to a person of ordinary skill in the art to incorporate an add/drop node along an optical span, such as the fiber transmission span 16_2 of Dennis to further add and drop different channels. Claims 13-14 further require similar limitations, as recited in claim 1 above.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M. R. SEDIGHIAN
PRIMARY EXAMINER